

AMENDMENTS TO THE SPECIFICATION

1.) Please replace paragraph 3 in the specification as filed with the paragraph below:

[0003] Nonlinear processes, such as stimulated Brillouin scattering (SBS) and stimulated Raman scattering (SRS), can limit the amount of power that an optical fiber can handle, thus limiting the power output of optical fiber lasers and amplifiers. Though these processes are complex, the detrimental effects of one or both can be reduced by limiting the power density in the core of the fiber. This can be accomplished by using a fiber having a core having a larger diameter and/or a lower ~~a lower~~ numerical aperture (NA), such that the fiber has a larger mode field diameter (MFD). The refractive index profile of an optical fiber can also be tailored (e.g., modified from the standard “step” index profile) to provide a larger MFD. Essentially, the power of the light propagating along the fiber is more spread out, such that the power density in any given area of the fiber is reduced.

2.) Please replace paragraph 28 in the specification as filed with the paragraph below:

[0028] A region, such as a cladding (e.g., the cladding **30** or the second cladding **32**) or a region (e.g., one or both of the regions **20** and **24**) of the core **18**, need not have a constant index of refraction. It is known in the art to vary the index ~~[[or]]~~of refraction, such, for example, where the core of a fiber has a graded index, to provide a particular optical property. Thus for a region to “comprise an index of refraction” does not mean that the index of refraction is necessarily constant throughout the region. The use of “comprise” is exemplary, and any other open-ended term can be used instead of “comprise” (e.g., have, include, etc.).

3.) Please replace paragraph 77 in the specification as filed with the paragraph below:

[0077] Processes are known for converting light at one of the wavelengths available from fiber devices to light at a more desirable wavelength. Some of the processes for converting light to another wavelength, such as launching light onto a phase matched crystal, can require that the light to be converted have a known linear polarization. Light is an electromagnetic wave in which the electric field can oscillate along a direction that is perpendicular to the direction in

which the light propagates. For example, if the electric field vibrates along the horizontal axis, the light is said to be horizontally polarized; if the light vibrates along the vertical axis, the light is said to be vertically polarized. Most fiber propagates light in two orthogonal polarizations (i.e., both vertical and horizontal) which couple back and forth as the light propagates along the fiber, such that the polarization of the light emanating from the fiber is a mixture of both vertical and horizontal polarizations and is thus not controlled. Proper control of the polarization can provide more efficient wavelength conversion. When unpolarized light is provided to the crystal, the component of the light that is polarized in the wrong direction is simply ~~not~~ converted and is wasted. Avoiding this waste means that the light provided to the crystal have the proper polarization.

4.) Please replace paragraph 79 in the specification as filed with the paragraph below:

[0079] FIGURE 4 illustrates an additional embodiment wherein an optical fiber, such as the optical fiber **12** of FIGURE 1, includes longitudinally extending regions for inducing stress in all or part of a selected region of the optical fiber. The optical fiber **212** includes a core **218** having an outer region **220** disposed about an inner region **224**. The fiber **212** includes a cladding **230** disposed about the core and a second cladding **232** disposed about the cladding **230**. The fiber **212** includes a pair of longitudinally extending regions **275**. The fiber shown in FIGURE 4 is a "Panda" style fiber in that each of the regions **275** has a substantially circular outer perimeter **277**. The longitudinally extending regions **275** can each have a thermal coefficient of expansion (TCE) that is different than the TCE of the region of the fiber that is disposed about the longitudinally extending region, such as, for example, the cladding **230**. Because the TCEs of the regions **275** and the cladding **230** are different, a stress is induced in all or part of a region of the fiber, such as, for example, the core **218**, when the fiber cools after being drawn, such as when being drawn from a heated preform. The stress can introduce a selected birefringence (i.e., different refractive indices for the orthogonal linear polarizations) due to the stress-optic effect.

5.) Please replace paragraph 90 in the specification as filed with the paragraph below:

[0090] In a fiber demonstrating polarizing behavior, the attenuation of one polarization (e.g., attenuation due to bend loss) exceeds that of the other polarization by a specified amount, such as, for example, at least 0.5 dB, ~~[[as]]~~ at least 1 dB, at least 2 dB, at least 3 dB, at least 6 dB, at least 9 dB, at least 12 dB, at least 15 dB, at least 18 dB, at least 20 dB or greater than 20 dB at a wavelength of interest. In conjunction with the foregoing, it can be further specified that the attenuation of one of the polarizations is less than or no greater than a specified amount, such as, for example, no greater than 1 dB, no greater than 3 dB, no greater than 5 dB, no greater than 7 dB, no greater than 9 dB, or no greater than 11 dB.

6.) Please replace paragraph 95 in the specification as filed with the paragraph below:

[0095] The second cladding ~~can~~ **432** can include longitudinally extending features **450** (e.g., can be microstructured) that have a different index of refraction than the material **458** that is adjacent the features **450** so as to provide a selected effective index of refraction for the second cladding **432**. The effective index of refraction can be quite low and can help provide a larger NA for the cladding **430** (e.g., at least 0.5; at least 0.6, or at least 0.7). The features **450** can include voids that include a gas (e.g., air) or are evacuated, or that include a liquid or solid having a different index of refraction (e.g., lower) than the material **458** that is adjacent to the features. In one practice the second cladding **432** can have an effective index of 1.35 or less. The second cladding **432** can be formed from a preform that includes a plurality of glass tubes, such as, for example, silica based tubes inside a larger silica based tube. The larger tube can form the outer region **436** of the optical fiber **412**. See, for example, U.S. Patent No. 5,907,652, entitled "Article Comprising An Air-Clad Optical Fiber", issued May 25, 1999. See also U.S. Patent No. 6,115,526, entitled "Ultra High Numerical Aperture High Power Optical Fiber Laser", issued September 5, 2000, where the second cladding comprises a gas. The first cladding can be microstructured and/or comprise a gas, as described above, particularly when the fiber is not double clad and/or when the core of the fiber receives pump light directly (e.g., the fiber is end pumped). The '652 and '526 patents are herein incorporated by reference to the extent necessary to understand the present invention, and to the extent that they do not contradict the teachings herein.